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LEAVE THE MILITARY!

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LEVEL REVIEW OF THE LITERATURE
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INVENTORY

APR. 1984

DOCUMENT IDENTIFICATION

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AD-A173 559

WHY SERVICE MEMBERS LEAVE THE MILITARY:
REVIEW OF THE LITERATURE AND ANALYSIS

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April 1984

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION <u>Unclassified</u>			1b. RESTRICTIVE MARKINGS		
2a. SECURITY CLASSIFICATION AUTHORITY			3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution is unlimited.		
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE					
4. PERFORMING ORGANIZATION REPORT NUMBER(S)			5. MONITORING ORGANIZATION REPORT NUMBER(S) DMDC/MTB/TR-84-3		
6a. NAME OF PERFORMING ORGANIZATION Defense Manpower Data Center		6b. OFFICE SYMBOL (If applicable) DMDC		7a. NAME OF MONITORING ORGANIZATION Defense Manpower Data Center	
6c. ADDRESS (City, State, and ZIP Code) 1600 Wilson Blvd, Suite 400 Arlington, VA 22209			7b. ADDRESS (City, State, and ZIP Code) 1600 Wilson Blvd., Suite 400 Arlington, VA 22209		
8a. NAME OF FUNDING/SPONSORING ORGANIZATION Ofc Asst Sec of Defense (MI&L)		8b. OFFICE SYMBOL (If applicable) OASD (MI&L)		9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER	
8c. ADDRESS (City, State, and ZIP Code) The Pentagon Rm 2B269 Washington, DC 20301			10. SOURCE OF FUNDING NUMBERS		
			PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.
			WORK UNIT ACCESSION NO.		
11. TITLE (Include Security Classification) Why Service Members Leave the Military: Review of the Literature and Analysis.					
12. PERSONAL AUTHOR(S) Boesel, David and Johnson, Kyle					
13a. TYPE OF REPORT Technical Report		13b. TIME COVERED FROM TO		14. DATE OF REPORT (Year, Month, Day) 1984 April	
15. PAGE COUNT 71					
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	Military/Manpower/Recruiting/Attrition/Retention/Bonuses/ Research		
05	09				
19. ABSTRACT (Continue on reverse if necessary and identify by block number)					
<p>This report investigates the factors associated with service members' decisions to remain in or leave the military. Results are presented from a literature review and analysis of current data provided by the services on reenlistment and first-term attrition.</p> <p>Retention of those who have skills and experience is a major goal of the military. The services compete with each other and with the civilian sector. Both the military and the potential service member have a package of positive and negative values. The services offer pay and security but also have difficult and sometimes dangerous jobs. The prospective military member offers his or her skills for the maximum value. The following are some of the conclusions reached in this report.</p> <p>Lump sum bonuses appear to increase first-term reenlistment. Lump sum rather than installment bonuses are more effective.</p> <p>Pay is an important factor of second-term and subsequent reenlistment.</p> <p>Promotions have a powerful effect on reenlistment while retirement benefits become</p>					
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION Unclassified		
22a. NAME OF RESPONSIBLE INDIVIDUAL Cynthia Ann Pilecki			22b. TELEPHONE (Include Area Code) 202-696-5833		22c. OFFICE SYMBOL DMDC

the incentive in later terms of service.

Although the service member complains about relocation, location of assignment and separation from family, these factors appear to only modestly affect reenlistment.

Quality-of-life factors appear to have little effect on the first term but increase markedly in importance thereafter.

The higher the test score and education level the lower the probability that first-term reenlistment will occur. It is presumed that a better education and stronger aptitudes are more competitive in the civilian labor force. In second term and subsequent reenlistments these factors have little effect.

Women are more likely than men to reenlist after the first term perhaps because they find better career opportunities in the military.

Research in the civilian labor force shows similarities to the military in that peoples' decisions to seek employment elsewhere is based on higher wages and better advancement opportunities.

First-term attrition is largely a function of mismatches between the individual and the military.

Age is a factor in attrition also. Those who are younger than 18 or 19 are more likely to attrit than others, presumably because they are less mature.

Attrition is also affected by the individuals' previous behavior problems, negative self-image and other psychological problems.

According to one study location does affect attrition. Army and Air Force members located in Europe and the Pacific are less likely to leave the Service than others. Those stationed in the northern regions of the U.S. were more likely to leave.

The conclusion of the report is that in general the analysis of service data supports the main findings that appear in the literature, but there are numerous inconsistencies possibly because of data limitations and the analytic methods which had to be used.

PREFACE

This study is based on research from a wide variety of different sources in the literature and on original analyses of recent data. The authors would like to acknowledge the continued guidance of Dr. Stuart H. Rakoff, Director, Manpower, Planning and Analysis, Office of the Assistant Secretary of Defense, Manpower, Installation and Logistics, throughout this research project. Appreciation is also due to the Army, Navy and Air Force who provided recent data for the analyses. A special acknowledgement is also due to Ross M. Stoltzenberg and John Winkler, The Rand Corporation, whose unpublished research reviewing literature on separations from military Service and terminations from civilian employment was extremely helpful in orienting us to the literature; some parts of the present study draw heavily upon their work.

EXECUTIVE SUMMARY

Because our military system increasingly requires skilled and experienced personnel, the retention of those who have such skills and experience has become a major policy goal. To inform current policy deliberations on retention, this report investigates the factors associated with Service members' decisions to remain in or to leave the military in the All-Volunteer Force era. To this end it presents the results of a review of the literature on reenlistment and first-term attrition, together with an analysis of current data provided by the Services.

To organize the diverse data available in the literature, a conceptual framework is developed. Based on a labor market model, it notes that the Services compete with each other and the civilian sector to attract and retain scarce skills. In this market competition, the Services are seen as offering jobs comprising packages of positive and negative values (e.g., pay and security on the positive side, difficult and sometimes dangerous work on the negative), which are designed to attract necessary skills at the lowest cost. Prospective military members, for their part, offer skill packages, also having positive and negative attributes, in an effort to maximize the values which they can receive for their labor. Accession and retention/separation decisions emerge from the interplay of these factors.

The values which make up the Service's job packages are classified as pecuniary and nonpecuniary incentives (or disincentives). The attributes which make up the Service members' skill packages are classified as individual characteristics. Relying on controlled, multivariate analyses the report then examines the relative effects of pecuniary factors,

nonpecuniary factors, and individual characteristics on reenlistment decisions. The effects of a similar set of variables on first-term attrition are also assessed.

The pecuniary variables are found to be the most important determinants of reenlistment, while attrition seems to be more heavily affected by individual characteristics.

Considering reenlistment decisions first, effects of base pay and allowances are calculated as elasticities--the percentage change in the reenlistment rate for a given percentage change in pay. For first-term reenlistment the average elasticity estimates range from 2.0 to 4.0, with a central tendency of 2.5. On average, a 10 percent increase in second-term pay would raise first-term reenlistments by 25 percent. Pay continues to be an important determinant of second-term and subsequent reenlistments, though there is less agreement over its impact than in the first term. The effect of allowances is approximately the same as that of base pay.

Bonus elasticities for first-term reenlistment are also similar to those of base pay, with a mean of approximately 2.8. In other words, on average a bonus which increases Service members' incomes by 10 percent would increase first-term reenlistment by 28 percent. Second-term elasticities may not be as high. Lump-sum bonuses appear to be more effective than installment bonuses, perhaps because their long-term financial value to the member is greater. In sum, the effects of the three "pay" variables--base pay, allowances, and bonuses--are rather similar, though the elasticities of lump sum payments may be higher.

Promotions have a positive effect on reenlistment, particularly in the second term, and presumably thereafter, while retirement benefits become an especially powerful incentive in the later terms of service.

Although it would seem that civilian-military pay differentials should have a pronounced effect on reenlistment decisions, the data on this point are not as clear as expected. Several studies report that the differential is a minor factor, while civilian unemployment is a major one. At least one study does find the expected relation, however. We hypothesize that there may be a threshold below which the differential has no effect.

Among the nonpecuniary factors, location and the relocation process have only modest effects on reenlistment. Although complaints about relocation and family separation are prominent in military surveys, these factors turn out in multivariate analyses not to be powerful predictors of reenlistment.

While pay variables remain an important determinant of retention throughout a military member's career, the impact of job satisfaction and quality-of-life factors seems to increase in the second and subsequent terms. Quality-of-life factors especially appear to have little effect in the first term, but increase markedly in importance thereafter.

Turning to the effects of individual characteristics on reenlistment, higher levels of education and higher test scores appear to be associated with lower probabilities of first-term reenlistment, although there is some evidence to the contrary. It may be that better education and stronger aptitudes make a Service member more competitive in the civilian labor

market, and therefore less likely to reenlist after the first term. In second term and subsequent reenlistments, education and test scores do not have much effect.

Women are more likely than men to reenlist after the first term, according to two studies, perhaps because they find better career opportunities in the military than in the civilian labor market. For the same reason we expected that nonwhites would be more likely than whites to reenlist. There is a fair amount of evidence to support this contention, although the results of one solid study flatly contradict it. Marital status and the presence of dependents have no consistent effect, but pro-service attitudes do seem to increase reenlistment probabilities.

Research on "retention" and "separation" in the civilian labor market shows results that are similar to those in the military literature. Specifically, pecuniary variables are shown to be the chief determinants of peoples' decisions to seek new jobs, with nonpecuniary variables playing a secondary role. "Higher wages or salary" is the reason most frequently cited by all groups; "better advancement opportunities" are also important, especially to older employees, as promotion is in the Service. Concern about location plays only a minor role in the decision, however.

Our own analyses of recent Service data also produce results that are similar to those in the literature, although there are inconsistencies. Most of these surveys have methodological problems, and hence analyses of the data must be viewed as exploratory.

According to our analyses, pecuniary factors play an important role in career intentions and in length of time spent in the military. Among these variables, concerns about pay affect members' decisions at various points in their careers, but retirement benefits are of particular concern to longer-term members. Location has some effect on retention, as do job conditions and the attitudes of members toward the military. There is also some evidence that quality-of-life factors become more important to military members as time goes on. The effects of individual characteristics on retention are slight, and the data are somewhat inconsistent.

As in some of the reenlistment studies reviewed, one of our analyses found that the civilian-military pay differential played no role in enlisted members' career intentions, although a proxy for civilian unemployment rates did. On the other hand, the pay differential did predict separation for officers. Since the differential is greater for officers than for enlisted men, the threshold hypothesis mentioned earlier finds some support in these data.

Unlike separations after the first term, which are primarily a function of organizational incentives and disincentives, first-term attrition is largely a function of mismatches between individuals and the Services. Hence, individual characteristics are the best predictors of attrition. Education level and test scores are powerful predictors of attrition, and the Services' use of these variables in the selection process is supported by solid evidence. Age is also a factor: those who are younger than 18 or 19 years old are more likely to attrit than others,

presumably because they are less mature. Race appears to have no effect. Being married may increase the probabilities of attrition, although there is some evidence to the contrary.

There is a strong relation between attrition and previous behavior problems, negative self-image, and other psychological problems, a finding that is also consistent with the literature on high school dropouts and delinquents. There is also a relation between pre-Service expectations and attrition: recruits who enter the Service with unrealistically high expectations are more likely than others to leave without completing the first term.

Among the organizational incentives and disincentives, location seems to have a substantial effect on attrition, at least according to one study. Army and Air Force members in Europe and the Pacific were less likely to attrit than others, while those stationed in northern regions of the United States were more likely to do so. Job characteristics also have some effect on attrition, but not a pronounced one, according to the research reviewed.

Our own analysis of Air Force Exit Survey data indicates that, consistent with the literature, age at enlistment does affect attrition, the younger recruits being more likely to leave. Also consistent with the literature, those who want an improved location are more likely than others to attrit. In addition, Air Force members who say that a reinstatement of GI Bill benefits would have kept them in the military are also more likely than others to attrit.

In general the analyses of Service data support the main findings in the literature, but there are numerous inconsistencies, some of which, we think, derive from limitations of the data and the analytic methods which had to be used.

INTRODUCTION

A military system that is becoming increasingly technical requires increasingly skilled and experienced personnel. Hence the retention of those who have acquired the training and experience necessary to meet the mission of the Services is an important policy goal.

The requirements for skilled and experienced personnel vary widely across Services and among occupational specialties, and so does the availability of people to meet those requirements. If we are to improve our ability to manage the skill and experience structure of the Armed Forces, we need to know more about the reasons why people remain in the Services, and why they leave.

Scope of the Report

This report investigates reasons for leaving the Active Components of the All-Volunteer Force (AVF), using data from studies conducted between 1975 and 1982 and from current analyses. The data focus largely on the separation/retention decisions of enlisted members of the four Services at reenlistment time. First-term reenlistments especially have been studied closely, though there are also data on reenlistments after the second term and subsequently. In addition, there is a good deal of information on first-term attrition.

Of particular interest in this report are the effects of location and relocation on separation/retention decisions. Frequent relocation of members and their families has long been a part of military life, but it has

taken on increased salience as many spouses have raised the priority of their own careers and as the interests of military families have become more prominent in individual decisions and in policy discussions.

Methodology

To address these retention questions a dual approach has been adopted. First, a search of the literature on retention published since 1977 has been conducted. Existing studies based on survey research and administrative records provide a wealth of information on the subject, and the replication of studies gives us some idea of the degree of certainty that can be ascribed to the results. Many of the findings in different studies reinforce each other, providing a solid basis for conclusions; in other cases the results are inconsistent, and no firm conclusions can be drawn. Thus the literature, taken as a whole, has a self-correcting tendency.

The second approach to addressing the retention issue has been to conduct original analyses using the most recent data available. To obtain such information, DoD asked the Services to provide retention data collected in surveys since 1980. The Army supplied reports from their 1981 and 1983 omnibus surveys of military personnel, and the Army Research Institute provided analyses from its 1983 survey of separating members. The Navy supplied computer data from their ongoing Separation and Retention Surveys, 1980-1983, along with appropriate documentation. Likewise, the Air Force provided computer data and documentation on the 1981-83 Career Surveys and Officer-Airman Exit Surveys. (The Marines did not have any

recent survey data on retention.) Clearly, without the cooperation of the Services, the analyses in this report would not have been possible.

The studies in the literature review were based on both administrative records and survey data. The records, essentially computer files of personnel data on military members, contain largely objective information and are restricted to relatively few variables collected for administrative, not research, purposes. As a rule they include data on all, or nearly all, members of a given military population--information such as enlistment date, aptitude test score category, pay grade, occupation specialty, and the like.

In contrast to the administrative records, the surveys were designed for research purposes; they contain both objective and subjective data; and they provide a broad range of variables. Surveys usually obtain information from samples of respondents rather than from populations, and the data collection is characterized by some degree of nonresponse. Thus studies based on records tend to focus on a few objective variables from nearly complete data sets (few missing cases), while those based on surveys examine a wider range of objective and subjective variables from data sets in which some information is missing due to nonresponse. (Nonresponse arises as a result of individuals not receiving questionnaires, or not being able to participate, or refusing to do so.)

The data available from these sources differ in terms of validity and reliability. In general the objective data reviewed in this report are good, though their quality varies with data collection methodology.

There is more variability in the subjective data, however. Attitudinal data based on standard scales are likely to be reliable and may also be valid, although this is harder to establish. Data on respondents' intentions (e.g., to enlist or reenlist) can be useful for analysis, and at least two studies (Chow and Polich, 1980; Orvis, 1982) have shown a relation between intentions and outcomes recorded in military files.

A third type of subjective data, respondents' stated reasons for a given action, are more problematic. There is some empirical research which demonstrates that the reasons or explanations people in the aggregate provide for their behaviors do not explain the behaviors as well as environmental contingencies controlled by researchers (Nisbett and Wilson, 1977). Our analysis of Service data depends rather heavily on reasons and explanations provided by Service members, and the limitations of such data are recognized. However, this problem can be mitigated by employing analyses which take account of both subjective and objective factors in retention decisions and by assessing the degree of consistency between the results of the analysis and those of research based on other data.

The studies examined use a variety of techniques for statistical analysis of the data, and the confidence one can place in their conclusions depends in part on the analytic methods employed. Univariate and bivariate statistics--e.g., frequency distributions and cross tabulations--are useful for describing the characteristics of a population or situation and for identifying relationships between those characteristics. They are not very useful for inferring causes, however; and in seeking to understand why Service members leave the military we must be concerned with causes. Causal inference analysis requires the use of multivariate techniques, in

which the possible effects of many explanatory factors are taken into account simultaneously. Most of the studies and analyses discussed in this report use multivariate methods, and these methods can be assumed by the reader unless it is otherwise stated.

Conceptual Framework

It will be helpful, for purposes of this report, to provide a brief conceptual framework within which data from diverse sources can be organized and understood. The research question, as noted above, is why some members leave the Service and others stay in until retirement. In analytic terms, we are interested in the factors that contribute to retention.

The ability of the Services to retain personnel can best be understood within the context of labor market competition for skills. In the era of the All-Volunteer Force, the Services must compete with the civilian sector and with each other to attract and keep people with the skills necessary to meet force requirements. Prospective employees, for their part, also compete with each other for jobs.

In this market it is useful to think of the jobs offered by employers as comprising packages of positive and negative values. Each job includes a variety of such values. On the positive side are incentives such as pay, benefits, advancement possibilities, and the less tangible aspects of job satisfaction; on the negative side are disincentives such as the need to give up leisure in order to work, the need, often, to subordinate personal choice to authority, and the difficulty and sometimes danger of a job. The

military tends to differ from other institutions in the packages it offers, because a military job encompasses more aspects of its members' lives than is generally true of organizations in the civilian economy. A military job tends to be a way of life.

In preparing job packages, employers can trade values off among one another. Thus, a military job may offer less direct pay but more benefits and more job security than a comparable civilian job. Similarly, a less desirable or more dangerous military job (negative values) may be made more attractive by increased compensation, such as a bonus. In assembling and adjusting job packages, employers try to find the combination of factors that will attract the necessary skills at the lowest cost.

In their efforts to attract skilled personnel, employers also tend to present their job packages to best advantage. While such "selling" is an indispensable part of the market system, "overselling" a job may result in unrealistically high expectations, and subsequent disillusionment, on the part of the new employee.

Just as organizations compete with one another to attract skilled employees, so (prospective) employees compete with one another for jobs, each seeking to maximize the values he or she receives for his/her skills. In the process, each employee brings to the labor market his or her own package of attributes, which can be understood as combinations of values. These values are always positive or negative in relation to a given job. The most critical positive values are the skills and abilities required to do the work, and the most critical negative values are the absence of such skills.

The prospective employee's package also includes a range of individual characteristics--such as personality, attitude, and general motivation,--which are more or less relevant to the objective requirements of the job and which employers regard as plusses and minuses. Beyond these are a variety of other individual attributes which in themselves usually bear no relation to the objective requirements of the job, but which are sometimes regarded as important by employers for social and cultural reasons. These include race, sex and age, which employers may consider to varying degrees in making hiring decisions. Traditionally, being white, male, and of young adult or middle age have been regarded as positive values for many jobs in the American labor market, while being nonwhite, female, and either very young or very old have been regarded as negative values. Equal opportunity laws and regulations are gradually changing this pattern of discrimination.

Individual attributes are important in this framework not only because they represent potential value to the employer, but also because they affect the way people respond to the packages of values offered by organizations. Because individuals differ in their needs, ambitions, preferences, and the like, different people will assess the same job package differently. A person who is married and has dependents, for example, may react differently to the prospect of being stationed overseas than someone who is not. Many such individual attributes are reflected in group differences, and summary measures of group characteristics, such as demographic data, can be used as analytic proxies for individual characteristics that affect labor market decisions. In addition,

attitudinal data can provide valuable insight into the motivation for such decisions.

In the hiring process employers screen and evaluate prospective employees, using such information as is available to assess the package of values that the individual brings to the market. Some measures of employee suitability--such as occupational test scores and information about past performance on a similar job--are fairly precise and specific, while others--such as level and kind of education--are rough but viable measures of skills. Still others--such as age, sex, and race--may be used by employers as proxies for certain kinds of general skills, although such uses are generally discriminatory.

Prospective employees, for their part, screen a range of job packages, weighing their positive and negative attributes. (In this framework current employees are regarded as prospective employees for other jobs, though their searches may be infrequent.) The jobs screened may cut across sectors of the economy--including both private and public, civilian and military options--and across institutions within sectors. After screening and evaluating the available package, the employee selects the one which will maximize the value he or she receives, providing that the employer concurs.

Applying this framework to the military, we note that the Services, in competition with each other and with the private sector, prepare job packages to attract and retain skilled personnel at the lowest feasible

cost. In the process, policy makers consider tradeoffs among values within packages--pay, bonuses, benefits, etc.--in order to facilitate the maximization of the skill/cost ratio.

In recruiting, the Services provide prospective members with information about their offerings, trying to "sell" the packages but not "oversell" them. Potential recruits are then screened and evaluated, using test information and other data, to assess their suitability for the Service and for specific military occupations.

Once a member has joined the military, his or her performance is assessed on a continuing basis to assure that the skill values received by the Services are commensurate with the incentives which they provide. Much of the Services' sorting out occurs during the first term and takes the form of attrition, although the process continues beyond that.

Like the Services, actual and prospective members assess the values offered to them, considering the range of incentives and disincentives which a military occupation and military life provide. In the course of this ongoing or intermittent evaluation, the member scans a range of job packages both inside and outside the Service. If the member feels that he or she can optimize job values within the military, he or she will stay; if alternatives outside look better, he or she will leave. After the first term, departures usually occur at reenlistment time. The individual skills, abilities, and credentials that the member has to offer weigh heavily in the decision process, and individual goals and attitudes shape the way in which Service offerings are regarded.

Within the framework outlined above, the report will attempt to explain why some members leave the Service and others remain, using two classes of explanatory factors: (1) organizational incentives (and disincentives)--the packages of positive and negative job values that the Services bring to the market; and (2) individual characteristics--the packages of skills and other personal attributes that prospective employees bring to the market. Organizational incentives include pecuniary and nonpecuniary factors. The former are monetary offerings or offerings that have monetary value. They may be either direct or indirect, current or deferred. Salary is an example of direct pecuniary compensation, military housing an example of indirect. Salary is current, retirement pay deferred. Nonpecuniary factors comprise all the other aspects of Service life that are regarded as attractive or unattractive by members, ranging from characteristics of the job, work place, and supervisors to less tangible features such as pride in organization and standards of behavior. Regarding individual characteristics, the measures of skills generally available in the literature are education level and aptitude test scores; other personal attributes include demographic characteristics such as age, sex, race, and marital status, and attitudinal data.

Organization of the Report

The report considers reenlistment and attrition separately. For each subject a literature review is presented first, followed by original data analyses. The literature on reenlistment generally proceeds from the assumption that the reenlistment decision resides with the military member, and that the incentives offered by the Services are critical to that

decision. Hence, our analysis of reenlistment begins with a consideration of organizational incentives and is followed by a consideration of individual characteristics. In contrast, the literature on attrition tends to regard the termination decision as residing with the military, or as an implicit mutual agreement between the Service and the member to the effect that the latter is not suited for the military. Attrition studies, therefore, tend to focus on the identification of individual attributes for which the Services can screen to reduce attrition. Hence our study of attrition will begin with individual characteristics and then consider such organizational factors as are available for review.

FACTORS CONTRIBUTING TO REENLISTMENT DECISIONS

We begin the discussion of reenlistment by considering pecuniary factors, because they are the ones most clearly intended to attract and retain the skills needed by the Services.

PECUNIARY FACTORS

Not surprisingly, there is almost universal agreement among researchers that compensation is a major, if not the major, factor in reenlistment decisions. In one sense compensation is of obvious importance: in the military, as elsewhere, people must be compensated for giving up their leisure and committing themselves to work. The question is not whether pecuniary incentives affect retention, but how much they affect it. Studies of compensation typically focus on the effects of marginal increments in pay and benefits, e.g., on how much a change in current compensation levels would affect retention. We will consider the marginal effects of several different types of Service incentives: (1) base pay and allowances; (2) bonuses; (3) promotions; and (4) deferred compensation such as retirement pay. Then we will assess the effect of civilian compensation incentives on retention.

Base Pay and Allowances

The marginal effect of base pay and allowances on first-term reenlistment has received considerable attention, and there is some consistency in estimates of the associated pay elasticities (the percentage change in the first-term reenlistment rate for a given percentage change in second-term pay). Warner (1981) in his review of the subject, concludes

that at a base reenlistment rate of 20 percent, the average elasticity estimates of studies range from 2.0 to 4.0, with a central tendency of 2.5. On average, then, and considering the central tendency of the various studies reviewed, a 10 percent increase in second-term pay would raise first-term reenlistments by 25 percent.

Some sense of the relative importance of military compensation can be gained from an analysis of first-term reenlistment by Chow and Polich (1980), based on a wide range of survey variables and administrative data. The authors find that regular military compensation (base pay, BAQ, BAS, and the tax advantages of BAQ and BAS) has the greatest effect on reenlistment of the 23 variables included in their final logit analysis. They estimate a reenlistment pay elasticity of 3.9: an across-the-board 10 percent pay raise would increase the first-term reenlistment rate 39 percent, from .225 to .312, for the 1976 sample studied.

Pay continues to be an important determinant of reenlistment in the second term (Fletcher, 1981; Hiller, 1982; Goldberg and Warner, 1982), though there is some disagreement about whether its impact is approximately the same as in the first term (Fletcher, 1981) or greater (Goldberg and Warner, 1982).

Because specific occupations within the military vary in desirability, presenting different combinations of positive and negative values, we would expect to find different pay elasticities across occupations. Indeed, Warner and Simon (1979) and Goldberg and Warner (1982) report substantial variation in pay elasticities among occupational groups in the Navy. The

lowest elasticities are apparent in the sea-going ratings, which appear to be among the least desirable in the eyes of Navy men considering reenlistment.

Allowances are usually not treated separately from other factors in regular military compensation, but there appears to be general agreement in the research literature that they affect reenlistment rates in the expected direction (Perry, 1977; Chow and Polich, 1980; Hiller, 1982). Only one study encountered in this review directly compares the marginal effects of base pay and allowances. Perry's (1977) analysis of the reenlistment decisions of avionics technicians concludes that both base pay and allowances affect those decisions to approximately the same extent. All things considered, it is evident that allowances are an important part of the total compensation package.

Bonuses

The effectiveness of reenlistment bonuses has been studied carefully, and evidence that they increase reenlistment probabilities is substantial. Enns (1977), for example, reviewing studies of elasticities for first-term reenlistment bonuses, reports a strong and consistent effect. He finds bonus elasticities ranging from 1.6 to 5.0, the mean lying at 2.8. On average, a bonus which increases a Service member's income by 10 percent would increase his or her probability of reenlisting by 28 percent, according to these calculations. Enns' own estimate of first-term reenlistment bonus elasticities is 2.0, somewhat below the 2.8 mean derived from other studies.

Chow and Polich (1980) also find a strong and consistent bonus effect among first-term Service members. According to their estimates, reenlistment bonuses are about 60 percent as effective as regular military compensation in inducing reenlistment. The authors argue, however, that this is probably an underestimate of the drawing power of bonuses, because the bonus coefficient is the result of two counteracting forces--the positive effect of the bonus and the negative effect of the other factors, such as undesirable occupational characteristics, that necessitated the bonus and are compensated for by it.

On the whole, it appears that "average" first-term reenlistment pay and bonus elasticities, as calculated by different studies, are roughly similar, falling somewhere in the range between 2.0 and 3.0. This similarity of effect is to be expected, because bonuses, like regular pay, are simply a means of providing the Service member with disposable income.

There is some evidence that second-term bonus elasticities are not as high as first-term (Warner and Simon, 1979; Hiller, 1982). In his analysis of data from the 1978-79 DoD Survey of Officers and Enlisted Personnel, Hiller finds average second-term elasticities of 1.3 to 1.7 for a hypothetical \$4000 bonus, depending on Service and pay grade. He argues that first-term reenlistment serves as a screen for those with greater or less taste for the military; reenlistees have a narrower distribution of tastes and include fewer marginal people who would be swayed by a bonus. Hiller also presents evidence that bonus elasticities within the second term decline with years of service. The author cautions, however, that the current evidence that the efficiency of bonuses declines as military careers advance is still preliminary and suggestive.

The question of whether lump-sum or installment bonuses are more effective in promoting reenlistment has also been studied, and the results are fairly clear. Enns (1977) reports that first-term reenlistment bonuses have the greatest effect when paid in a lump sum. Goldberg and Warner's (1982) findings are similar: lump-sum bonus payments are more effective than installment payments in both first-term and second-term extensions and reenlistments. In addition to their ability to provide immediate gratification, lump-sum bonuses have some obvious long-term financial advantages for the recipient in that they provide an opportunity for investment and the accrual of interest.

Promotions

Theoretically one would expect promotions to be a powerful predictor of retention behavior. Promotion is one of the chief means whereby employees are enabled to optimize their job values within the organization, rather than looking elsewhere. Additionally, within the military especially, the lack of a promotion may be a signal to the employee (member) that the skill values he or she brings to the organization are considered marginal.

Data concerning the effects of promotions on reenlistment probabilities are found both in Chow and Polich (1980) and Hiller (1982). Chow and Polich report that first-term Service members' perceived ability to affect their promotion rates in the military, as compared to civilian life, has a significant impact on their likelihood of reenlisting. The effect of perceived promotion potential is about one-third that of regular military compensation for these first-term members.

Hiller, analyzing survey data, finds that the perceived probability of promotion is the strongest, most consistent predictor of second-term reenlistment among the fifty-two variables included in his regression analysis. Strong and significant effects are found in each of the four Services examined. Past promotions also show a consistent positive relation to reenlistment probabilities, though the relation is significant ($p. < .05$) only among Navy and Air Force personnel.

Retirement

Retirement benefits are the primary form of deferred pecuniary incentives available to military members. As part of the job packages that employees evaluate in their periodic retention decisions, one would expect their salience to increase as retirement becomes a present, rather than a future, value.

Consistent with this line of thought, data from the Air Force Human Resources Laboratory suggest that forms of deferred compensation such as retirement have little influence on career decisions by first-term enlistees, but rise to major influence by the seventh year of service. Warner (1981), reviewing research on reenlistment in the Navy, concludes that "post-second-term reenlistment behavior is driven by the retirement system." He notes that retention rates rise from about 80 percent at 10 years of service to almost 100 percent just prior to retirement vesting, and then fall off sharply thereafter. It seems clear that retirement becomes very important after the first several terms of service and that its importance increases as the time for vesting approaches.

Civilian Pay and Benefits

As employees periodically scan the packages of job values available to them, they may review job possibilities across sectors. In analyzing military reenlistment decisions, it is essential to consider the extent to which the values offered by the civilian economy draw members away from the military. One commonly used measure of the relative attractiveness of jobs in these two sectors is the military-civilian pay differential, which is derived from a comparison of compensation for similar jobs in the military and the civilian economy. It is by no means a comprehensive measure of the drawing power of civilian, or military, occupations, however, because as we have seen, pay is only one element--albeit a very important element--in the packages of job values that employees assess.

Cohen and Reedy (1979) analyzed quarterly administrative reenlistment data for nine major occupational groups in the Navy over a 20-year period ending in 1977. They found that earning differentials between military and private sector occupations did not have much effect on reenlistment decisions, while civilian unemployment rates had strong effects.

Chow and Polich (1980) report similar findings. Using average hourly wages from the 1976 Current Population Survey data, grouped by education, sex, race, and age, together with data from the 1976 DoD Survey of Officers and Enlisted Personnel, the authors find that the difference between military and civilian pay has only a modest impact on first-term intentions to reenlist, while civilian unemployment rates have substantially larger effects.*

*In this particular analysis Chow and Polich predict intentions to reenlist, as measured by survey questions, rather reenlistment decisions recorded in military records, which is their dependent variable elsewhere in their report. The authors present persuasive evidence that intentions are good measures of subsequent reenlistment behavior.

Data from Hiller's (1982) study of second-term reenlistments reinforce the impression that military/civilian pay differentials are not a major factor in the decision to stay in the Service or leave. Hiller's analysis shows a significant negative relation between the perception of better civilian pay and second-term reenlistment in the Navy, and a nonsignificant negative relation for the Marine Corps, but no substantial relation for either the Army or the Air Force.

Goldberg and Warner (1982), however, find that the pay differential is a powerful predictor of extension and reenlistment for both first- and second-term Navy personnel, though the level of significance achieved in the analysis of first-term behavior is the higher of the two. The data cover the period 1974-1980, during most of which the pay differential favored the Navy.* Hence it tends to increase extension and reenlistment probabilities. According to this analysis, high civilian unemployment rates increase first- and second-term reenlistments, but decrease extensions of the first term. Apparently some Navy members, contemplating a poor civilian labor market, decide to reenlist rather than to extend.

In theory, the difference between military and civilian pay should be a factor in the reenlistment decision, and it seems puzzling that there should be so much evidence to the contrary. It may be that there is a threshold level above which the pay differential matters to Service members and below which it does not.

*Regular military compensation was the measure of Navy pay.

NONPECUNIARY FACTORS

Over the years the research on reenlistment has tended to focus more on pecuniary than on nonpecuniary factors, though there are a number of prominent exceptions (e.g., Chow and Polich, 1980; Hiller, 1982; Fletcher and Giesler, 1981). This emphasis seems to have occurred for a number of reasons: (1) because pecuniary variables are assumed to be the most important and obvious determinants of reenlistment behavior; (2) because they are very manipulable policy factors; and (3) because data on them are readily available from administrative files.

There are research data on the effects of nonpecuniary factors in at least three areas, however. One is location and the relocation process; the second is job characteristics (defined in terms of the functions of work); and the third is individual characteristics. Each of these will be considered in turn.

Location and the Relocation Process

In terms of our conceptual scheme, it is difficult to anticipate how location and relocation will affect retention without knowing how Service members regard these aspects of military life. Fortunately, descriptive data are available to address this question. The Services periodically collect information on their members' reasons for remaining in the military or separating. In the Army's 1981 omnibus survey of officers and enlisted men, respondents were asked which of a list of 10 reasons weighed most heavily against their reenlisting. "Being separated from my spouse" ranked third, after dissatisfaction with job and pay, and "overseas assignment" ranked fourth.

Results from the Navy's ongoing survey of departing members show that throughout FY80 and FY81 the first-ranked complaint of departing enlisted members was "Pay is too low," and the second-ranked complaint was "Dislike family separation." Other rotation-related items--"I want to live someplace permanently" and "Dislike sea duty"--also ranked among the first ten out of thirty reasons for leaving. In FY82 the complaint about pay dropped to fifth place, after a substantial pay raise, and to seventh place in FY83. On the other hand, dislike of family separation rose to first place in FY82 and remained there the following year. Desire for a permanent residence rose to third place for both years, and dislike of sea duty also showed some increase in ranking.

The Air Force's separation survey finds that in the years 1980-1983 the expectation of "more geographical stability in [a] civilian job" ranked approximately third out of 53 possible choices as the main reason for leaving. The desire for higher pay and more job satisfaction were ranked first and second in that period, with higher pay considered most important in 1980 and 1981, and job satisfaction in 1982 and 1983.

These surveys indicate that Service members are dissatisfied with many aspects of location and the relocation process, and they suggest the hypothesis that this dissatisfaction is an important reason for leaving the military. However, the data must be analyzed carefully before any conclusions about cause can be offered. The Navy and Air Force separation surveys, for example, provide information only on those who leave the Service. It may be that those who remain are just as dissatisfied with location and relocation requirements, but stay in the Service for other reasons. Moreover, multivariate analyses which control for things such as

marital status, dependents, level of education, and the like may produce results that differ markedly from these descriptive data. Consider, for example, two different treatments of data from the 1978-79 DoD Survey of Officers and Enlisted Personnel (Doering and Hutzler, 1982). In a list of 17 reasons for leaving the military, the item "dislike family separation" ranked fourth, after three compensation variables--results similar to those for the Service surveys just discussed. In addition, two other location-related reasons--"dislike location assignment" and "frequency of PCS moves"--were selected by sizeable numbers of respondents. Yet a multivariate analysis of these data by Hiller (1982), specifically including a set of 11 location variables, finds that the effects of location on second-term reenlistment are generally weak and inconsistent. Chow and Polich (1980) reach similar conclusions about first-term reenlistments with data from an earlier version of the same survey.

Let us examine the results of these and other multivariate analyses more closely, considering first the effects of location on reenlistment and then those of relocation and family separation. Hiller's analysis is particularly noteworthy here because of its explicit focus on the effects of location. Of the eleven location/relocation variables examined, only three showed any significant association with second-term reenlistment decisions, and in each case the relation pertained to only one of the four Services. One of these, the variable "next tour undesirable" does appear to have a significant negative impact on second-term reenlistments in the Air Force, but not the other Services. Moreover, we do not know what

aspects of the next tour are regarded as undesirable; in many cases it may be the job rather than the location or the move. (The other two significant variables concern the relocation process and will be discussed in that context shortly.)

Using responses to hypothetical questions, Hiller also finds that respondents would be more likely to reenlist (regardless of term) if they were offered a guaranteed location for doing so. The author notes that "location of choice appears to be equally effective as a bonus, amounting to one third of annual pay." He further observes that the effect of offering location of choice as an incentive to reenlist seems to decline with years of service, though he cautions that further analysis would be necessary to lend more credence to this suggestion.

Further information regarding locational effects on retention can be found in Chow and Polich's (1980) report, as mentioned briefly above. The authors find that being stationed outside the United States has a modest positive effect on reenlistment probabilities, but the association does not reach statistical significance (i.e., $p < .10$).

Other data focus on the process of moving rather than the final location. Descriptive results from a series of Air Force Permanent Change of Station (PCS) surveys conducted in 1980, 1981, and 1982 show dissatisfaction at all levels with the out-of-pocket expenses that Air Force members must absorb in moving. Hence, the descriptive data suggest the hypothesis that dissatisfaction with having to move is a cause of separation from the military. The results of multivariate analyses on the effects of relocation are more tenuous, however. Chow and Polich (1980)

report that assignment to a specialty requiring a great deal of rotation has a nonsignificant ($p. < .10$) negative effect on first-term reenlistment probabilities. They also report that being separated from one's family at least 25 percent of the time has no significant impact on first-term reenlistment probabilities, other things being equal. Goldberg and Warner (1982), on the other hand, find that the more sea duty a sailor expects in the next term of service, the less likely he is to opt for a first-term extension or to reenlist, controlling for marital status and a range of other variables. These effects seem to dissipate in the second term, however.

Along somewhat different lines, Hiller (1982) finds that home ownership is negatively associated with second-term reenlistment in the Navy, Air Force, and Marine Corps, though only the Marine Corps results are statistically significant. These data no doubt reflect the views of some Service members who do not reenlist because they have bought homes and do not want to move. There are probably others, though, who have bought homes because they do not intend to reenlist.

Finally, Arima (1981) in a multivariate analysis of data on Navy line officers, concludes that 11 percent of the variation in their intention to retire can be accounted for by their degree of satisfaction with their rotational assignments. The degree of satisfaction is a function of both the assignments themselves and the procedures by which the assignments are made. The author estimates that about half of the variation is accounted for by each.

Reviewing the effects of "Service environment" (which includes location) on first-term reenlistments, Chow and Polich conclude:

"It appears that most of the aspects of service environment measured in this study--working in a rotation-imbalanced specialty, family separations, stationing outside the United States, and long hours of work--have very little detrimental effect on reenlistment rates."

Our own conclusion after a review of the literature is that both location and relocation have some effect on reenlistment decisions, though the effects are not nearly as pronounced as those of the pecuniary factors discussed earlier.

Job Satisfaction and Job Characteristics

The quality of a job and an employee's satisfaction with it should be important components of the reenlistment decision. We would expect pleasant and psychologically rewarding work to increase retention when other things such as pay and benefits are controlled. On the other hand, we would expect difficult and unrewarding work in the military, or more positive alternatives in the civilian sector, to reduce retention.

Given the amount of research on job satisfaction in the military, there are surprisingly few multivariate studies relating this factor to reenlistment. Perry's (1977) analysis of the first-term reenlistment of

avionic technicians finds that job satisfaction, as compared to perceived civilian alternatives, is the second most important factor in reenlistment decisions, following career intentions. Similarly, Fletcher and Giesler (1981), in their analysis of quality-of-job and quality-of-life factors in the military, report positive controlled associations between reenlistment and various job characteristics such as meaningful work, autonomy, good personnel utilization, and recognition/prestige. While satisfaction with pay is an important contributor to reenlistments in both the first and subsequent terms, the importance of job satisfaction in its various aspects seems to increase with successive reenlistment decisions. (Fletcher, 1981)

Like Enns, Hiller (1982) finds the expected relation between the perceived attractiveness of civilian jobs and second-term reenlistment. The perception that "civilian bosses are better" than those in the military negatively affects second-term reenlistment in the Navy and the Air Force, while the perception that civilian training is better negatively affects reenlistment in the Marine Corps, according to this analysis. Hiller also finds that Service members who are doing the kind of work for which they are trained are more likely than others to reenlist.

Quality of Life

The analyses of Fletcher and Giesler (1981) and Fletcher (1981) focus on quality-of-life factors as well as quality-of-job factors in Navy retention. Variables such as military housing, work schedules, and medical and family services can be expected to affect such things as extension and reenlistment because they are presumably part of the packages of values that military members assess in making their retention decisions. In a summary analysis of the data, Fletcher (1981) reports that quality-of-life

variables play a rather minimal role in first-term decisions, increasing dramatically in importance in the second and subsequent terms. These findings are interesting, but confidence in the conclusions must be qualified by the fact that only one pay variable--actually an attitude toward pay--is included in the analysis among a great many "quality" variables.

Relative Effects of Pecuniary and Nonpecuniary Factors

The weight of evidence from the studies reviewed suggests that pecuniary factors have considerably more impact on reenlistment than nonpecuniary factors. It is true that much of the research on the subject has been derived largely from analyses of pecuniary variables, with too little attention being paid to attitudinal and other data. But even those studies which include a range of both pecuniary and nonpecuniary variables in the analyses conclude that factors such as pay, benefits, and promotions are the most important determinants of reenlistment decisions. There is some evidence to the contrary in the studies by Fletcher and Giesler (1981), Fletcher (1981) and Perry (1977), but the first two are based largely on attitudinal variables, with little objective data, and the second is limited to only one occupation in one Service.

INDIVIDUAL CHARACTERISTICS

Having assessed the impact of organizational incentives and disincentives on reenlistment, we turn to a consideration of individual

characteristics--in terms of our conceptual framework the package of skills and other values that the individual brings to the labor market. These characteristics vary in their degree of functional relevance to the tasks to be performed, but, as noted earlier, functional relevance is not the only criterion of value in the labor market. Individual characteristics, especially attitudes, are also important because they affect the way members evaluate the Services' packages and assess the relevance of those offerings to their own needs and goals.

Education and Test Scores

Education and aptitude test scores are among the characteristics most relevant to job performance. Within our conceptual scheme, we would expect that Service members who have higher education levels and higher test scores and therefore presumably better skill packages to offer would also have a wider range of job opportunities available to them in the civilian market; they would therefore be more apt to leave the Service than other members. There is some evidence to support this expectation. Chow and Polich (1980), report that graduation from high school, having some college, and having higher AFQT scores all reduce the likelihood that a first-term Service member will reenlist. Goldberg and Warner's (1982) findings also support this expectation, showing that Navy men in AFQT Categories I and II are less likely than those in other categories to extend or reenlist after the first term. Similarly, Fletcher and Giesler (1981) report a negative association between AFQT Categories I and II and first-term reenlistment among Navy men in one broad occupational group, though not in two others. The authors also find a positive relation between AFQT score and first-term extensions, a finding not consistent with the hypothesis.

While the literature on the relation between education, test scores, and first-term reenlistments is relatively clear, the data on second and subsequent terms are weak and inconsistent. Hiller (1982) finds no relation between education and second-term reenlistment, and Fletcher and Giesler's (1981) results are mixed for both education level and AFQT category, as are those of Goldberg and Warner (1982).

These results suggest a composition effect. After the first-term reenlistment decision, education and test scores cease to be predictors of separation/retention decisions. This could be accounted for by a change in cohort composition: it may be that those members whose skills (as measured by education level and test scores) make them inclined to leave the Service do so at the end of the first term. Thereafter, members with higher education levels and test scores are just as likely to stay as are their less skilled counterparts.

Sex

A number of studies (e.g., Becerra, 1983) have shown that women expect to find better career opportunities in the public sector, including the military, than in the private sector. This is not surprising, given that there is less sex-based discrimination in the public sector. In line with such research, we would anticipate that women are more likely than men to reenlist in the military, other things being equal. While few retention studies use sex as a predictive variable, the evidence tends to confirm this expectation.

Chow and Polich (1980) report that women have higher first-term reenlistment probabilities than men across all three Services, and Hiller (1982) finds the same for second-term reenlistments in the Air Force (though not the other Services). While the studies reporting these findings are sound, more evidence in the form of replication by other studies would be desirable before concluding that women are definitely more likely than men to reenlist.

Race

Because nonwhites, like women, suffer from discrimination in the civilian labor market, they tend to have better career opportunities in the public sector, including the military, than elsewhere. Hence, we anticipate that minority status will increase one's likelihood of reenlisting in the military. Here the empirical evidence is less clear. Chow and Polich (1980) do report a strong and significant relation between race and first-term reenlistment--nonwhites are much more likely than whites to reenlist across the three Services studied. Similarly, Fletcher and Giesler (1981) find that nonwhites are more likely than whites both to extend their first term and to reenlist in the Navy. Racial effects on extension and reenlistment in subsequent terms of service are not as strong and consistent, but tend in the same direction, according to this study. On the other hand, Goldberg and Warner's (1982) analysis of data from Navy records concludes that blacks are less likely to extend and to reenlist in both the first and second terms. And Hiller (1982) finds no significant or consistent effect of race on second-term reenlistments in the four Services.

Were it not for Warner and Goldberg's results, we might conclude that race predicts first-term reenlistment behavior, but has no effect thereafter because of cohort composition changes--similar to those described for the education variables. The Goldberg and Warner study is technically solid, however, and the findings are inconsistent with this interpretation.

Marital Status and Dependents

With regard to the effects of marital status and dependents on reenlistment, it could be argued that Service life places unusual stresses on families and that having a family therefore increases the likelihood of separation. It could also be hypothesized that members with families are more stable than others and hence less likely to separate.

Neither of these hypotheses is borne out by the research data, however. There appears to be no relation between marital status or the presence of dependents and reenlistment after either the first term (Chow and Polich, 1980; Goldberg and Warner, 1982) or the second (Goldberg and Warner, 1982; Hiller, 1982). One study does report such an effect (Fletcher and Giesler, 1981), but the weight of evidence in the literature suggests no connection between the two.

Attitudes

Finally, one would expect pro-Service attitudes to favor reenlistment, increasing the value that the member sees in a military job and military life. Indeed, there is some evidence to support this conjecture. Specifically, Chow and Polich (1980) report that those who believe in the

necessity and importance of what the military does and are not troubled by Service rules and regulations are considerably more likely than others to reenlist at the end of their first term.

Perspective on the Military Retention Literature: A Brief Look at Civilian Data

Interestingly, research on "retention" and "separation" in the civilian labor market shows results that are similar to the military data. In May 1976 a special survey of workers was conducted, through the Current Population Survey, to ascertain the extent of job search by employed workers and their main reasons for looking (Rosenfeld, 1977). The results of the survey indicate that job turnover is as characteristic of the civilian labor market as it is of the military, and that people in both markets leave jobs for similar reasons.

Table 1 indicates the main reasons given for job search by selected characteristics of workers. Here we see that the dominant reason, for every category of worker, is "higher wages or salary." Over a third of the workers gave this as their main reason for search, and 10 percent cited "better advancement opportunities."

Another quarter of the respondents gave various "nonpecuniary" reasons. Overall, the most frequently cited of these was "better hours and conditions," followed by "opportunity to use skills." Only a small proportion (3%) cited desire for a "better location."

Table 1

Main Reason Employed Workers Looked for Another Job
by Selected Characteristics
(May 1976)

	Total Searching (000's)	(Percent)	Higher Wages or Salary	Better Advancement Opportunities	Hours, Conditions	Use Skills	Better Location	Summer Job	Job Ending, Losing Job	Job Seasonal or Temporary	Other
Age: 16 to 24 years	1,532	100.0	36.8	8.1	10.5	9.6	2.6	13.4	5.8	2.8	10.5
25 years and over	1,736	100.0	32.0	11.2	10.7	9.0	4.0	3.8	9.2	3.7	16.4
Sex: Men	1,910	100.0	35.8	12.2	9.3	8.3	3.2	5.9	7.7	3.7	12.9
Women	1,359	100.0	32.1	6.3	12.5	10.7	3.5	10.5	7.4	2.6	14.4
Occupation:											
Professional, Technical	659	100.0	24.2	13.0	6.0	8.8	7.1	12.3	11.6	2.6	14.4
Managers	227	100.0	27.1	24.5	13.1	9.2	.8	2.1	7.7	1.5	14.0
Salesworkers	232	100.0	44.4	5.8	7.7	14.3	2.3	9.1	4.4	1.5	10.4
Non-Farm Laborers	220	100.0	39.8	7.3	9.2	10.1	2.3	8.3	4.4	5.7	13.0
Total, 16 years and over	3,269	100.0	34.3	9.8	10.6	9.3	3.3	8.4	7.5	3.3	13.5

Source: Rosenfeld, 1977, table 4.

Controlling for age, "higher wages" are relatively more important for younger workers than for older ones, as is the opportunity to use skills. "Better advancement opportunities," on the other hand, are more important to older workers. Among the other nonpecuniary factors, "better location" becomes more important with increased age.

Controlling for type of occupation, we find that those in the less skilled occupations tend to be most interested in higher wages. If we subtract the widely disparate fractions leaving jobs for the largely structural reasons (the last four columns), we find that 40 percent of the remaining professionals and 36 percent of the remaining managers are searching for more pay, and almost as many for better advancement opportunities. Some 15 percent of the professionals and 12 percent of the managers want a chance to use skills, and 12 percent of the professional and technical workers (1 percent of managers) want better location.

In sum, pecuniary variables are the predominant reasons for retention and separation decisions in the civilian labor market, as they are in the military. A desire for higher pay especially tends to motivate younger workers in the civilian sector, while it seems to remain important throughout military careers. In both sectors, however, promotions tend to motivate older employees more than younger ones. Likewise, location is a factor in both civilian and military job search decisions, though not a major one for most groups.

ANALYSIS OF RECENT DATA

In an effort to provide additional insight into the factors affecting retention in the military, we have analyzed four recent data sets provided by the Services--the 1982 Air Force Career Survey, the 1982 Air Force Exit Survey, the 1982 Navy Exit Survey, and the 1983 Army Exit Survey. The Career Survey collects data periodically from samples of current Air Force members with a view to ascertaining their intentions to reenlist or remain in the Service and the reasons for their intentions. The exit surveys, in contrast, are administered only to members who separate from the Services before retirement; their purpose is to assess the members' reasons for leaving. The population covered by the exit surveys, however, comprises the great majority of military members, since it includes all those who spend any period of time up to twenty years in the Service.

While these data sets provide a valuable opportunity for analysis of retention decisions, their limitations must be noted. First, the exit survey instruments are made available on a continuing basis to those separating Service members willing to complete them. Reports of survey results do not usually indicate response rates, but if the completed questionnaires are divided by the total separations in a given year, the response rates are very low, and there is no way of assessing nonresponse bias. Second, since all respondents in exit surveys are separating from the Service, these data sets cannot shed light on the factors that distinguish "leavers" from "stayers." They can, however, provide information on factors associated with the timing of the Service members' departures, e.g., they can help explain what things are associated with the

length of time a member remains in the Service. Because those who leave before retirement comprise such a large proportion of all Service members, the factors that contribute to longer service also contribute to retention.

Third, with the exception of the Air Force Exit Survey, variables in these data sets do not permit us to distinguish between first-term attrition, separation after the first term, separation after the second term, and subsequent departures. This has implications for our interpretation of the data. If a given variable affects separation probabilities differently in attrition, first-term reenlistment decisions, and second-term decisions, those differences cannot be taken into account in the analyses. The results will reflect "average" probabilities, which may mask such differences as those between a significant negative coefficient for a variable in attrition and a significant positive coefficient for the same variable in first-term reenlistment. Consequently, the analyses cannot provide results that are strictly comparable to those in the literature, though a rough comparability may exist.

Finally, the questions posed in these surveys ask respondents to indicate their reasons for their decisions or intentions, and, as noted in the introduction, stated reasons such as these do not explain behavior as well as objectively verifiable factors. To the extent that our analysis can take such objective factors into account, however, this problem can be mitigated.

In light of these limitations, our analysis of most of the data sets must be viewed as exploratory. Where the data permit firmer conclusions, the discussion will so indicate.

FACTORS IN RETENTION

One data set which provides valuable information for retention analysis is the 1982 Air Force Career Survey. The survey was administered by mail to a stratified random sample of 3,674 Air Force members, of whom 2,401, or 65%, returned questionnaires. The data are reasonably good and permit comparison with findings in the literature.

Of particular interest for this study, the survey contains a question on the respondents' intentions to make a career of the Air Force and a series of 34 factors that could influence the decision for or against such a career decision. Respondents were asked to evaluate each of these factors on a nine-point scale ranging from "no contribution" to a "major contribution." Since this survey includes people with both positive and negative career intentions, it permits an evaluation of distinctions between "leavers" and "stayers," at least as identified in terms of intentions. Research on the validity of intentions data as a proxy for behavioral data suggests that this is not an unreasonable approach (Chow and Polich, 1980).

The preliminary analysis model we have used with this data set is an ordinary least squares linear probability model, with "career choice" as the dependent variable, equal to 1 if the respondent at least leaned toward a career, and 0 otherwise. The career factors were entered with values of

0 to 9 ("no contribution" to "major contribution"), making the assumption that there are equal intervals of importance between response levels. Education, race, and age variables were entered as control variables. Only male respondents were included in this analysis, as the numbers of female respondents were not sufficient for analysis. Table 2 presents the principal coefficients of the regression model.

In discussing the results of this analysis, we will focus on enlisted men in order to facilitate comparison with the literature on reenlistment, though the data on officers will also be discussed.

In Table 2 the variables under the heading "Pay, Benefits, and Security" include a range of pecuniary and nonpecuniary factors which might affect Air Force career decisions. According to these data the civilian-military pay difference has no effect on career choice among enlisted men, but "current economic conditions," of which unemployment was perhaps the most prominent feature in 1982, tend to favor career intentions. These results reenforce the findings of Cohen and Reedy (1979), Chow and Polich (1980), and Hiller (1982), but run counter to those of Goldberg and Warner (1982). Because the military/civilian pay differential is greater for officers than for enlisted men, our finding a significant negative association between the pay differential and career intentions for officers provides some support for our earlier speculation that there may be a threshold below which the differential is of no consequence to retention decisions. Other incentives under "Pay, Benefits,

Table 2

Factors Affecting Intentions
to Make the Air Force a Career

Dependent Variable = 1 for Positive Career
Choice
= 0 for Negative Choice

(t-statistics in parentheses)

	<u>Officers</u>	<u>Enlisted</u>
Constant	0.594 (3.10)	0.398 (3.04)
<u>Demographics</u>		
Age	0.006* (2.15)	0.007* (1.94)
High School Graduate	-0.074 (-0.35)	-0.071 (-0.72)
Some College	-0.187 (-0.66)	-0.078 (-0.79)
College Degree	-0.200 (-1.19)	-0.144 (-1.39)
Total Active Federal Military Service	0.002 (1.00)	0.006 (1.61)
<u>Benefits, Pay, Security</u>		
Military/Civilian Pay Difference	-0.011* (-2.44)	-0.005 (-1.09)
Current U.S. Economic Conditions	-0.004 (-0.53)	0.014* (2.12)
Retirement Benefits	0.002 (0.74)	0.005 (1.65)
30-day Paid Vacation	0.012* (3.34)	0.014* (3.50)
Job Security	0.014* (4.16)	0.009* (2.73)
<u>Training & Education</u>		
Job Training Opportunities	0.007 (1.83)	0.004 (0.91)
Formal Education Opportunity	0.006 (1.23)	0.011* (2.72)

Table 2 (Cont'd)

Factors Affecting Intentions
to Make the Air Force a Career

Dependent Variable = 1 for Positive Career
Choice
= 0 for Negative Choice

(t-statistics in parentheses)

<u>Location</u>	<u>Officers</u>	<u>Enlisted</u>
Variety of Locations	-0.009 (-1.81)	0.011 (2.33)
Assignment Stability	-0.007 (-1.88)	0.005 (1.13)
Travel	0.013	-0.004
<u>Job Conditions</u>		
Work Conditions	-0.010* (-2.46)	-0.014* (-3.30)
Job Variety	0.000 (0.03)	-0.008 (-1.80)
Job Responsibility	0.005 (1.23)	0.008 (1.92)
Co-workers	0.004 (0.75)	-0.012* (-2.33)
<u>Affective Values</u>		
Patriotism	0.010* (3.26)	0.004 (0.99)
High Behavioral/ Discipline Standards	0.011* (2.50)	-0.011* (-2.65)
Prestige	0.004 (1.05)	0.008 (1.81)
<u>Other</u>		
Acquaintances/Friends	0.012* (2.41)	0.017* (3.45)
N	745	1087
R ²	0.36	0.37
Mean of Dependent Variable	0.921	0.847

*A t-statistic greater than 1.96 indicates significance at least at the $p < .05$ level.

and Security" that contribute to career intentions for enlisted men are job security, and 30-day paid vacations, two features of military life that also affect officers' intentions positively.

With regard to training and education benefits, enlisted men who say that "formal education opportunities" are a reason for staying in the Air Force are more likely than others to plan an Air Force career, while "job training opportunities" are a more important factor in officers' intentions. These results make sense in light of the fact that officers have college educations, for the most part, while enlisted men do not.

Location also has an effect on career choices by enlisted men--a positive effect, according to these respondents, who appear to value a "variety of locations." This finding, which suggests that relocation is regarded as a plus by Air Force enlisted members in considering their career decisions, runs counter to the mildly negative effects of relocation evident in the research literature. Officers, unlike enlisted men, tend to regard both "variety of locations" and (lack of) "assignment stability" as negative factors in considering Air Force careers, though neither of these items quite achieves statistical significance.

Certain job conditions seem to affect Air Force career intentions negatively: "coworkers" and "work conditions" reduce the chances of an enlisted man's intending to choose a career with the Service. Officers' career intentions are also affected negatively by their perception of work conditions. The survey data shed no light on why working conditions and coworkers affect career intentions in this way. On the other hand, "job

responsibility" is counted as a plus by enlisted men in considering whether to make the Air Force a career, though the results fall just short of statistical significance. The findings on this subject support those of Fletcher and Giesler (1981) in a general way, in that they demonstrate a relation between quality-of-job factors and retention.

Among other nonpecuniary values in the military, "high behavioral/discipline standards" are seen by enlisted men as a disincentive to making the Air Force a career. The officers, on the other hand, see it as an incentive. Evidently feelings about behavior standards and discipline depend on who gets disciplined by whom. One final factor--friends and acquaintances--plays a positive role in the Air Force career intentions of both enlisted men and officers.

Among the demographic variables, only age is significantly associated with career intentions, and age is no doubt closely related to length of service. The longer one is in the Air Force, the more likely he is to intend to make the Air Force a career. The signs for level of education above high school graduate are consistently negative, and even though the associations with career intent are not statistically significant, the consistency of the results suggests that members with more education are less likely than others to plan an Air Force career, a finding similar to those of Chow and Polich (1980) and Goldberg and Warner (1982).

The Air Force Exit Survey

Further information on factors affecting retention can be gained by analyzing data from the Air Force Exit Survey of 1982. As part of the separation process, questionnaires were made available to separating Air

Force members. Between January and the end of September 1982, 281 officers and 2,693 enlisted men completed questionnaires. Though response rates are not reported, they are clearly low. Further, since this is an exit survey, we cannot distinguish "stayers" from "leavers."

A key question in the survey, for our purposes, is: "Which one of the factors listed below would have been most influential in keeping you in the Air Force: (Indicate letter choice.)." There follows a list of 26 factors, including reduced duty hours, fewer remote and overseas tours, a guarantee of no changes to the current retirement system, and increased pay.

We have analyzed the responses of male Service leavers to these questions. Multivariate regression analyses were conducted using length of service as the dependent variable and demographic and opinion factors as independent variables. The survey item indicating a desire for "more pay" is used as the omitted variable in the analysis, the one with which all the other independent variables are compared. Because it was cited with about equal frequency by respondents at all lengths of service, it is not a useful predictor of length of service. Since the mean longevity for the "more pay" variable is about the same as for the survey population, we will simplify the discussion by expressing comparisons in terms of the population average.

Interpretation of the results is more complex than usual because of the nature of the survey questions. Since the exiting airmen responded to a question that asked what one factor would have kept them in the Service, we can construe the perceived absence of this factor as a source of concern

or dissatisfaction. If an exiting member says that "stronger leadership support of the retirement system" would have kept him in, we can infer that the perceived absence of such support is one reason for his leaving.

The analysis also poses another interpretive problem--that of causal direction. If we were to find that dissatisfaction with supervisors were associated with early leaving, we might reasonably conclude that improving supervision would increase Service longevity. However, if we find that dissatisfaction with retirement benefits is associated with greater longevity, it would not make sense to conclude that longevity could be increased by heightening dissatisfaction with the benefits. The more plausible interpretation would be that dissatisfaction with retirement benefits becomes a more salient concern to longer-term Service members. In effect, then, what our analysis provides is a set of controlled associations between various complaints and longevity. Assessing whether the complaint "causes" the amount of longevity or is a function of it must be a matter of judgment and educated guesswork, given the available data.

Table 3 presents the results of the analysis for both officers and enlisted men. Once again we will focus on the discussion on enlisted men to facilitate comparison with results from the research literature.

Considering the pecuniary variables, the first finding worth noting does not appear in the table but was mentioned earlier--namely that the level of concern about pay is roughly the same for members at all different lengths of service; hence concern about pay does not predict longevity. (Note that this is not the same as saying that level of pay has no effect on longevity; there is ample evidence to the contrary.) This finding

Table 3
Factors Affecting Length of Service
Among Air Force Separates

Dependent Variable: Total Active Federal Military Service
(t-statistics in parentheses)

	<u>Officers</u>	<u>Enlisted</u>
Constant	-15.06 (-12.23)	-13.54 (-26.16)
Age	0.670* (19.93)	0.766* (70.7)
High School Graduate	4.12* (7.07)	0.161 (0.36)
Some College	4.06* (5.92)	0.191 (0.43)
College Degree	2.75* (5.43)	-1.216* (-2.45)
Married	0.370 (1.22)	0.410* (4.57)
Less Pay & Benefit Uncertainty	0.707 (0.54)	0.57* (1.99)
Guaranteed No Change in Retirement System	-1.09 (-0.81)	1.18* (3.36)
Stronger Leadership Support of Retirement System	0.855 (0.71)	1.20* (3.19)
Reinstatement of GI Bill Benefits	-0.274 (-0.43)	-0.58* (-4.11)
Improved Location	-1.320 (-1.25)	-0.52* (-2.12)
Increased Supervisor Sensitivity	-0.886 (-1.58)	-0.023 (-0.13)
Career Guarantee Before O-4	-1.512 (-1.87)	N/A
R ²	.64	.77
N	398	2033
Mean of Dep. Variable	6.26	5.40

*A t-statistic greater than 1.96 indicates significance at least at the p. < .05 level.

parallels the results of Fletcher's (1981) analysis, which concludes that attitudes toward pay are important in both first-term and subsequent reenlistment and extension decisions.

Three other concerns about pecuniary factors are associated with longer time in the service among enlisted men. Two focus directly on the retirement system (wanting "guaranteed no change in the retirement system" and "stronger leadership support of the retirement system") and the third focuses on retirement at least partially (wanting "less pay and benefit uncertainty"). The most plausible interpretation of these data is that enlisted men who have been in the service longer than average tend to worry more about the viability of the retirement system than others, a conclusion that parallels the findings of Warner (1981).

Once again, educational benefits appear to be a factor in retention: "reinstatement of GI Bill benefits" is associated with earlier separation among enlisted men, controlling for a range of other factors. Part of this association may be accounted for by attriting first-term members and who feel they might stay to complete their first term if GI Bill benefits were available thereafter. Others who are still eligible to obtain GI Bill benefits may have left in 1982, earlier than they would otherwise, in order to use the benefits before their eligibility expired. In the case of yet other members who are not now eligible, however, it seems that reinstatement of these benefits should decrease longevity, because they would provide an incentive to leave after the completion of their term to attend college. For his group of respondents the results may express a more general concern about education among those who leave early.

Consistent with the literature reviewed above, a desire for "improved location" is associated with earlier departures, other things equal. In this case, though, the results are clearly significant at the 95 percent confidence level: those who are dissatisfied with their location are likely to leave the Air Force one-half year (.52) earlier than others.

Turning to individual characteristics, age is of course associated with longevity for enlisted men, as it is for officers. Again, the data on education support the hypothesis that enlisted men with higher levels of education are more likely to leave the Service because they have more skills that are marketable in the private sector. (Chow and Polich, 1980; Goldberg and Warner, 1982.) In this case, Air Force enlisted men with college degrees tend to leave the service 1.2 years earlier than their counterparts without degrees. Finally, married members tend to stay longer than unmarried, according to these data, although the results of the literature research on reenlistment show no consistent effect.

Most of the associations for officers are not statistically significant, though respondents who expressed a desire for "career guarantee before [grade] O-4" seem likely to leave earlier than others. Concern about location appears to be associated with earlier departures for officers, as it does for enlisted men, though the results are not significant. In contrast to the findings for enlisted men, however, education level for officers is strongly and consistently associated with greater longevity, a finding which does not square with the civilian market hypothesis.

The Navy Exit Survey

The Navy, like the Air Force, conducts a voluntary separation survey among personnel leaving the Service. Our analysis here is of data from questionnaires returned by 16,063 Navy enlisted men during FY 1982. The data are somewhat problematic due to a low response rate, the fact that all respondents are "leavers," and the nature of the key questions, which ask members their reasons for leaving. Again our analysis sample is restricted to males, although the Navy survey is large enough to provide a substantial number of females.

The survey covers people leaving the Service for virtually every possible reason, under every kind of discharge, and discharge codes are available in the data set. While we realize that many "non-voluntary" separations are at the serviceman's initiative, we have attempted to restrict the sample to those leaving voluntarily as a matter of record, i.e., generally at the end of their term of service.

In form, the analysis follows that of the Air Force Exit Survey; we analyze factors that are considered important by leavers at different lengths of service. There are several differences in the way that analysis must be conducted, however, as dictated by the format and content of the Navy questionnaire. For one thing, the dependent variable cannot be years of service (TAFMS), since that is not given in the questionnaire. The closest we can come is a question on the number of reenlistments the respondent has prior to separation. Neither do we have data on age or race-ethnic category, and the absence of age as a control variable poses a particular problem. For example, Navy men who differ in terms of a

characteristic, such as marital status, may also differ in terms of age. Longevity effects that appear to stem from marital status may simply be a function of the different ages of the groups.

The reasons for leaving are taken from a series of thirty questions, in each of which the respondent is asked to evaluate the importance of a given factor in his decision to separate. Responses are on a scale of 1 (not important) to 5 (extremely important), similar to the factor evaluations in the Air Force Career Survey. Table 4 presents the results of this analysis. The qualifications discussed earlier, regarding the simplicity of the model and the limitations on inferences obtainable from a sample consisting only of leavers, still of course obtain.

As regards to pay and benefits, the analysis indicates that while concern with low pay is associated with greater-than-average longevity (as measured by number of reenlistments), concern with a possible loss of benefits is associated with shorter time in the Service. Those who "fear [the] loss of more benefits," and "fear [the] loss of retirement benefits" tend to leave the Navy earlier than average. The findings with regard to retirement are puzzling in light of most other research, which indicates that retirement is a concern of longer-term members.

Educational benefits again appear to be significant in retention decisions, though it is hard to understand their effects. As in the Air Force Exit Survey, a concern about GI benefits is associated with fewer reenlistments, in this case because exiting members say they are leaving to avoid losing their benefits. On the other hand, concern with inadequate education and skill training are associated with greater longevity.

Table 4

**Factors Affecting Length of Service
Among Enlisted Navy Separatees**

**Dependent Variable: Number of Reenlistments
(t-statistics in parentheses)**

Constant	0.192 (5.85)
<u>Demographics</u>	
Married	0.298* (16.15)
High School Diploma	0.002 (0.06)
Associate Degree	0.167* (2.92)
BA	0.291* (3.82)
Graduate Degree	0.162 (1.19)
<u>Pay</u>	
Pay is too Low	0.033* (4.97)
<u>Benefits</u>	
Fear Loss of More Benefits	-0.019* (-2.61)
Fear Loss of Retirement Benefits	-0.025* (-3.27)
Keep from Losing GI Benefits	-0.057* (-9.46)
Poor Commissary/Exchange	-0.024 * (-3.36)
Unavailable/Poor Housing	0.033* (5.23)
Can't Get Education, Skills	0.027* (4.43)
<u>Location</u>	
Family Separation	0.013 (2.02)

Table 4 (Cont'd)

Factors Affecting Length of Service
Among Enlisted Navy Separates

Dependent Variable: Number of Reenlistments
(t-statistics in parentheses)

Job Characteristics

Work Hours too Long	-0.023* (-3.46)
Can't Get Desired Rating	0.024* (3.40)
Can't Get Desired Detail	-0.028* (-4.72)

Regulation and Personal Autonomy

Petty Regulations	0.028* (4.05)
Regulations Prevent Advancement	0.012 (1.90)
Little Freedom in Non- Work Hours	0.023* (3.56)
Want Freedom to Quit	0.012 (1.92)
N	6131
R ²	.08
Mean of Dependent Variable	0.318

*A t-statistic greater than 1.96 indicates significance
at least at the p. < .05 level.

Among the nonpecuniary variables, family separation is associated with a larger number of reenlistments, another puzzling result, in light of Goldberg and Warner's (1982) finding that sea-duty is associated with earlier departures from the Navy. Marital status is controlled in both analyses, so some other explanation is needed.

Dissatisfaction with job characteristics presents a mixed pattern, but concern with certain nonpecuniary issues--family separation, regulations and personal autonomy--are consistently associated with later-than-average departures from the Navy. The consistency of the data on regulations and personal autonomy is particularly striking. Dissatisfaction with the perceived restrictiveness of Navy life appears to be a significant grievance among those who leave the Navy later than most.

Among the individual characteristics, marital status (being married) shows a very strong association with number of reenlistments, and there is also a positive association with education at or above the high school diploma level.

The results of the analysis suggest that, while pecuniary concerns are salient at various points in a Navy man's career, distinctly nonpecuniary concerns such as job characteristics, location, regulations, and personal autonomy tend to emerge later in the careers, a conclusion consistent with Fletcher and Giesler's (1981) and Fletcher's (1981) findings. However, the relatively large number of uninterpretable results and of findings inconsistent with other data, together with the methodological problems

cited earlier cast some doubt on the viability of these data for the purposes of assessing retention. The foregoing analysis should therefore be regarded as preliminary and exploratory.

Army Exit Survey

Very recently (September to December 1983) the Army Research Institute (ARI) conducted a survey of Army personnel leaving various installations. The approximately 2,000 separatees surveyed included those leaving training, those going on PCS, and those leaving the Service for various reasons. The data from this survey have not yet been fully processed, but ARI has generously prepared, at our request and on very short notice, some statistical computations that provide some insights into factors influencing soldiers' decisions to leave the Service. Once again, the analysis is very preliminary and tentative.

The analysis sample consisted of enlisted males separating at the end of their service obligation (ETS). As in the analysis of the Air Force exit survey, the dependent variable is total time in service (TAFMS), and the independent variables are a group of demographic characteristics and a set of categorical variables indicating "which factor, from among those [ten] listed below, would be [your] strongest reason against reenlisting in the Army." As in the Air Force exit analysis, the effect of these factors on length of service is presented relative to the effect of "my pay," which is the categorical variable omitted from the regression. Table 5 presents the regression results.

Table 5

Factors Affecting Length of Service in the Army

**Dependent Variable: Total Active Federal Military Service
(t-statistics in parentheses)***

Constant	3.962 (13.38)
High School Diploma	0.482* (2.53)
Black	-0.513* (-2.12)
White	-0.488* (-2.07)
Hispanic	-0.410 (-1.44)
Retirement Pay, Benefits	0.017 (0.08)
Quality of Medical Care	-0.108 (-0.42)
Quality of Government Housing	-0.463 (-1.61)
No Choice of Assignment	0.107 (0.53)
Being Separated from Spouse	0.449* (2.35)
Overseas Duty	-0.040 (-0.16)
(Not) Getting Reenlist- ment Bonus	-0.061 (-0.27)
N	2232
R ²	.024

*A t-statistic greater than 1.96 indicates significance at least at the p. < .05 level.

The analysis shows surprisingly little relationship between length of service and the importance of the various factors. The clearest finding is that separation from one's spouse is a concern that becomes particularly salient among those who separate late in their careers, a finding that parallels the apparent effects of "family separation" in the Navy. Quality of government housing, on the other hand, seems to be a complaint among those who leave early.

With regard to individual characteristics, having a high school diploma is associated with greater longevity in the Army, the results again perhaps registering the effects of first-term attrition. In the case of race, the omitted category is "other," and in comparison with others, blacks, whites and Hispanics all tend to leave early. The similarity of the coefficients for the three groups, however, indicates that there is not much difference between these groups in their mean length of service.

The Army survey contains a great deal of data that will probably be useful in analyzing motives for separation, since in addition to "leavers" it contains "stayers" who are defined by their actual, observed decisions to leave or reenlist. Reenlistment intentions are also asked. Further careful analysis along these lines is being pursued; the current findings are most useful for exploratory purposes.

FACTORS CONTRIBUTING TO FIRST-TERM ATTRITION

In the process of mutual evaluation that goes on between the individual employee and the organization, either may decide that the other does not measure up to expectations in some important way. That is, either may conclude that the value received from the other is not sufficient to warrant continuing employment. When this happens in private industry, the result is a firing or an early resignation. In the military it most often takes the form of first-term attrition.

As noted earlier, research on attrition has tended to focus on the individual characteristics of those who leave. The assumption is that the Services have not gotten the value they require in these recruits, and that the way to remedy the problem is to bring in better recruits by changing enlistment incentives and refining selection procedures.

In many cases, however, it may be the individual member who concludes that Service life is not providing the expected value and who decides to leave before completing the term. Although the formal decision belongs to the Services, it is often not difficult for a member to take actions which will result in the Service's allowing him to leave. Therefore, any study of factors contributing to attrition should also assess the role that Service characteristics play in attrition.

Our review of the attrition literature begins with an examination of individual characteristics contributing to attrition, and then takes up, in turn, the role of location, job characteristics, and recruiting practices. We then present an analysis of factors contributing to attrition based on data from the Air Force Exit Survey.

INDIVIDUAL CHARACTERISTICS

Individual characteristics may affect attrition in at least two ways: they may reflect some skill deficits or other deficits which cause the Service to dismiss the member; and they may reflect personal attitudes and orientations which lead the member to reject the Services. Let us examine the effect of these attributes.

Education and Test Scores

With regard to education levels and test scores, there is clear evidence that those who attrit show relative deficits. The research findings are substantial and consistent: attrition probabilities increase as both education levels and test scores decline (Lockman, February 1977, December 1977b; Mobley et al., 1978; Greenberg, Murphy, and McConeghy, 1977; Sands, 1977, 1978; Guthrie, Lakota, and Matlock, 1978; Landau and Farkas, 1978; Lau, 1979; Buddin, 1981; and Fletcher and Giesler, 1981). According to Warner (1981), "the research on attrition has established that high school graduation is the factor most strongly related to chances of survival. HSG status seems indicative of motivation and persistence." Evidently this lack of motivation and persistence carries over into the Service. Similarly (with regard to test scores), many of those who find school difficult may also find the functional requirements of the Services difficult. Clearly, the Services' use of AFQT scores and high school graduation in the selection process is supported by solid evidence.

Age

There is also reason to believe that a relative lack of maturity is a cause of attrition. Less mature recruits may be unrealistic in their expectations or uncertain of their commitments. A number of studies have found an association between age at entry and attrition. Buddin (1981), for example, reports a strong relation between age at accession and the likelihood of attriting from the Army. Those who are under age 18 when they enter are considerably more likely than those 18 and over to attrit. A similar but weaker pattern holds true for the Air Force. Guthrie, Lakota, and Matlock (1978) and Sands (1977, 1978) also find that younger enlistees are more likely to attrit or fail to reenlist than older enlistees.

The study by Lockman (1977), however, reports a curvilinear relation between age at entry and attrition from the Navy--sailors younger than 18 or older than 19 years of age have higher separation rates than 18 and 19 year-olds. Preliminary results from a study by Black and Fraker (1984) are very similar. Using longitudinal data from a national sample of high school graduates who entered the military, the authors find that 19 year-old entrants are less likely to attrit than those who are either younger or older. In other work, Greenberg, Murphy, and McConeghy (1977), analyzing Navy data, find that attrition is higher for younger personnel in the fleet, but lower for younger recruits.

The data from these studies suggest that attrition rates are relatively high for young entrants--those under age 18 or possibly 19--who are presumably less mature than their older counterparts. Whether the

likelihood of attrition declines with increasing age or whether the curvilinear pattern found by Lockman and Black and Fraker holds generally true has yet to be determined.

Race

Data concerning the effects of race on attrition are largely inconsistent. Lockman (February 1977), studying a 1973 cohort of Navy recruits, finds higher attrition rates among blacks in the first term of service, but not thereafter; for a 1974 cohort Lockman finds no race effect. Greenberg, Murphy, and McConeghy (1977) report that blacks are more likely than whites to attrit from the Navy, while Youngblood (1980) finds that blacks are slightly more likely to attrit from the Marine Corps. Buddin (1981) finds no effect on attrition in the Army and Air Force except in two occupational categories, where blacks were less likely than whites to leave. Inconsistencies in these findings and methodological problems in several of the studies make it impossible to reach any firm conclusion about the effects of race on attrition. The best guess is that it is a minor, if not negligible, factor.

Marital Status and Dependents

With regard to marital status and dependents, the evidence from the research is also mixed. A number of studies report that married people and those with dependents are more likely to attrit than single members (Lockman, 1977; Sands, 1977, 1978; Guthrie, Lakota, and Matlock, 1978; Mobley et al., 1978; Landau and Farkas, 1978). Buddin (1981), however, finds that being married and having dependents reduces the probability of

attrition, while Greenberg, Murphy, and McConeghy (1977) report no effect. Most of the studies reviewed do suggest a relation between families and first-term attrition, but the evidence to the contrary precludes our having much confidence in such a conclusion.

Attitudes

Finally, there is a substantial body of literature on the psychological and behavioral characteristics of attrition-prone enlistees. Not surprisingly, as in the literature on high school dropouts and juvenile delinquents, there is a strong association between attrition and previous behavior problems, negative self-image, and other psychological problems (Atwater, Skrobiszewski, and Alf, 1976; Erwin and Herring, 1977; Holiberg, Hyscham, and Berry, 1977; Greenberg, Murphy and McConeghy, 1977; Wilcove, Thomas and Blankenship, 1979; Cooper, 1979; and Lau, 1979). As Yellin (1975) observed in his study of attrition from the Navy, attritees tend to be

. . . more inclined not to like themselves and [have] a liberal attitude toward drugs, a negative attitude toward authority and discipline, and a general disregard for law and order . . . They [indicate] a lack of drive or motivation and [exhibit] antisocial behaviors. They also [have] a negative outlook on life.

LOCATION

While location has a rather modest effect on reenlistment, its effect on attrition appears to be strong, at least according to one study.

Buddin's (1981) analysis of FY75 male accessions in the Army and the Air Force finds that "duty location unambiguously alters the likelihood of attrition after controlling for individual characteristics and occupation." (p. 25) The author considers the effects of both initial post-training duty location and final duty location on attrition in five different occupational groups--skilled technicians; support and administration; electrical/mechanical equipment repair; crafts, service and supply; and (for the Army) combat arms.

In Table 6, adapted from Buddin, plus and minus signs indicate positive or negative probabilities of attrition that differ significantly ($p. < .05$) from the statistical controls used in the analysis. For Air Force members there is a clear effect of location on attrition; assignment to Europe or the Pacific tends to reduce the probability of attrition for first-term members, while assignment to the North Central region of the United States tends to increase it. The pattern is most striking in the case of final duty locations, but the data for first locations are consistent with it. The results for the Army are less consistent, although it appears that initial-duty location in the Pacific and final-duty location in Europe reduce the probabilities of attrition.

Elsewhere, there is evidence that sea duty in the Navy contributes to attrition (Rodney et al., 1980), as it does to separation after the first and second terms (Goldberg and Warner, 1982).

Table 6

Contribution of Post-Training
Duty Location to the Probability
of First-Term Attrition*

<u>Air Force</u>					
<u>Initial Duty Location</u>	<u>Skilled Techs</u>	<u>Support & Admin</u>	<u>Elect/ Mech Equip Repair</u>	<u>Crafts, Service & Supply</u>	<u>Combat Arms</u>
CONUS					
Northeast					
North Central				+	
South					
West					
EUROPE		-			
PACIFIC	-				
<u>Final Duty Location</u>					
CONUS					
Northeast					
North Central	+	+	+		
South					
West					
EUROPE	-	-	-	-	
PACIFIC	-	-	-	-	
<u>Army</u>					
<u>Initial Duty Location</u>					
CONUS					
Northeast					
North Central					
South					
West			+		+
EUROPE		+			-
PACIFIC	-		-	-	-
<u>Final Duty Location</u>					
CONUS					
Northeast			+		+
North Central				+	
South					
West					
EUROPE	-	-	-	-	
PACIFIC				+	+

*Signs in this table indicate statistically significant ($p. < .05$) positive or negative contributions to first-term attrition.

Table adapted from Buddin (1981).

JOB CHARACTERISTICS

As with reenlistment, attrition rates vary by occupation, because various occupations present different values to individual members. Buddin (1981) reports that occupation and occupational specialty (MOS, AFSC) are significantly associated with first-term attrition from the Army and the Air Force, controlling for a range of other factors. Obviously, the particular occupational characteristics that affect a Service member's retention decision and the reasons why they affect that decision will vary widely across occupations and individuals. Buddin notes, for example, that "an Air Force recruit who is a skilled technician is about 8.8 percent more likely to leave early than a similar recruit . . . whose occupation is in the craftsmen, service, and supply handler group." In this case it is likely that the strong civilian market for skilled technicians is a factor in these attritions. In other cases the difficulty of the military work, the physical work environment, the characteristics of the supervisors, and a range of other features may be involved. Thus, MOS and AFSC are global variables which are associated with attrition in the Army and the Air Force.

Preservice Expectations

The expectations and information which enlistees bring with them into the military should have some effect on their likelihood of completing the first term or attriting. If their information about military life is realistic, their chances of finishing the term should be greater than if they are unrealistically high. Expectations may be shaped by a number of

influences and information can come from a variety of sources. The two sources of influence and information which are under policy control are military advertising and recruiters.

Advertising copy, before it is released, is carefully scrutinized to ensure that it does not create unrealistic expectations or misrepresentation. Misperceptions, of course, are out of direct control. Recruiters, although carefully briefed and trained, nevertheless understandably may bias their presentations to potential recruits towards presenting their Services in the most positive light. The potential is there, together with other influences such as family and friends, for creating expectations which may be unmet.

There is some evidence in the research literature to suggest that preservice expectations and attrition are related. Laundau and Farkas (1978), for example, administered questionnaires to Navy recruits early in training and later determined from records which respondents completed training and which ones dropped out. Those who remained were more likely to report that recruiters had given them an accurate picture of what to expect in the Navy and were more likely to expect negative experiences during training. Whether the inaccurate information came from recruiters, or is being attributed to them in error, is unclear. Two other studies of Navy attrition (Advanced Research Resources Organization, 1979; Lau, 1979) found that those who left during the first term were more likely than others to report pre-enlistment expectations that were unsatisfied by Navy life. Goodstadt, Yedlin, and Romanczuk (1978) reach similar conclusions on the basis of in-depth interviews with Army attriters, and Grinn (1978) reports similar findings in the armed services of other countries.

FACTORS IN ATTRITION - A FURTHER ANALYSIS OF THE AIR FORCE EXIT DATA

Using data from the 1982 Air Force Exit Survey, described earlier, we conducted an analysis of factors contributing to attrition by comparing the responses of those members who left within the first four years to those of others who left later. As noted in that earlier description, one group of Air Force members is not included in the data set--those who remained in the Service until retirement. We assume, however, that the inclusion of these long-term career members would not markedly change the composition, attitudes, and opinions reflected in the data.

The analysis is an ordinary least squares regression based on a simple linear probability model; the measure of attrition is the extent to which members leave the Service within the first four years. The explanatory variables are demographic data and the exiting members' responses to a list of things that might have kept them in the Service. Table 7 presents the results of this analysis.

Consistent with the findings of other research, the age of first-termers contributes to retention, according to this analysis. Younger members are more likely to attrit. Race, a factor included in the analysis but not shown in the table, has no significant association with attrition, a finding also consistent with the literature. Level of education, surprisingly, shows no significant association with attrition, and being married reduces the probability of attrition, consistent with Buddin (1981), but not with the other studies reviewed.

Table 7

**Probabilities of Completing the First Term
(Non-Career Air Force Enlisted Men)**

Dependent Variable = 1 if leaving with more than 4 years
of service
= 0 otherwise

(t-statistics in parentheses)

Constant	0.520 (5.71)
Age	0.012* (6.14)
High School Graduate	0.022 (0.03)
Some College	0.026 (0.33)
College Degree	0.058 (0.07)
Marriage	0.095* (6.02)
Improved Location	-0.110* (-2.53)
More Training Opportunity	0.081* (2.20)
Reinstatement of GI Bill Benefits	-0.068* (-2.73)
R ²	.08
N	2033
Mean of Dependent Variable	.867

*A t-statistic greater than 1.96 indicates significance
at least at the p. < .05 level.

The relevance of location to first-term attrition is again evident in these data, as it was in Buddin's study. Enlistees who are unhappy about their location have a lower probability of completing the first term than do others. Indeed, location has the largest coefficient of any of the variables examined.

Concern about two organizational incentives, educational benefits and training opportunities, is also related to attrition, according to this analysis. Paralleling the findings of the Air Force Career Survey analysis, those who say reinstatement of GI Bill benefits would have kept them in the Service are more likely to attrit than others; those who have complaints about training opportunities are more likely to finish their first term. According to these data, a substantial increase in educational benefits would cause some members who attrit to finish the first term in order to leave then to take advantage of the benefits.

In sum, the results of this analysis with respect to age, race, and location find support elsewhere in the literature. The absence of any relation between education level and attrition is inconsistent with other research, and the observed relation between education benefits and attrition are similar to other Air Force data, though further replication would be useful.

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